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THE ROUND-HEADED APPLE TREE BORER

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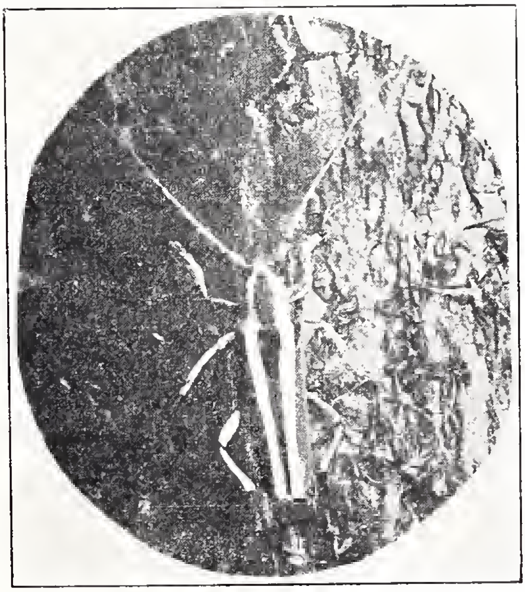

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THE ROUND-HEADED APPLE TREE BORER IN PENNSYLVANIA

The Round-Headed Apple Tree Borer is a serious enemy of apples and quince in certain regions of Pennsylvania.

Injury is caused by the larvae which eat out galleries beneath the bark and in the heartwood, usually near the base of the tree.

Adults emerge in May and June and eggs are laid shortly afterwards in the bark near the base of the host trees.

Control measures: Use a small hoe or trowel to remove the first two or three inches of soil from about the tree, then

Cut out the borer wth a sharp knife or puncture by means of a slender wire; or

Place eight or ten drops of carbon bisulfide in the hole and plug shut at once with clay or soap.

In regions of heavy infestation, use a repellant wash against the adults to prevent egg laying.

Natural control by woodpeckers has been estimated to amount to fifty to seventy-five per cent of the borers.

In areas where borers are known to be numerous, remove all wild host trees within one-half mile of the orchard site.

THE ROUND-HEADED APPLE TREE BORER*

By

T. L. Guyton and J. N. Knull

In certain regions of Pennsylvania, (more especially in the southern portion) the round-headed apple tree borer ranks high as a destructive enemy of the quince and apple. Some investigators place it next to the codling moth in importance as an apple pest. The borer is particularly harmful to young trees. Unless the grower is on a watchful lookout new plantings may be very seriously injured by the attack of this insect.

NATURE OF INJURY

The apple tree is injured by the feeding of the larvae or worm stage of the borer, which chews large holes or galleries that may reach into the heart of the tree. The point of feeding is usually near the base of the tree. A single borer may produce considerable injury. Trees which are infested with several borers have a sickly appearance, produce yellow foliage and grows very slowly. Continued yearly attacks may in time kill the tree outright or so weaken it that it is broken off by the wind. The galleries also make favorable conditions for the development of heart rots. When numerous, the adult beetles may do some injury to fruit and foliage.

HOST PLANTS

The following plants serve as hosts for the borer, with preference in the order named;—quince, apple, pear, mountain ash, shadbush, wild crab, hawthorn and choke berry. It will be noticed that the last five named are wild plants, and these are the native food plants of the borer.

LIFE HISTORY

The adult round-headed apple tree borer is a handsome elongate beetle about three-fourths of an inch in length. The dorsal surface is light brown, with two pure white stripes running the entire length of the insect. The front of the head and the ventral surface are also white, while the legs and antennae are gray.

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*Saperda candida Fab.

Life history studies made at Hummelstown and Chambersburg by the junior author gave the following life cycle:

The adults emerge from their pupal cells during the latter part of May, and throughout the month of June. The round exit holes are located near the bases of the infested trees, and are about one-fourth inch in diameter.

After emerging, the adults feed on the leaves, twigs and fruit of the host plants. Mating takes place and usually egg-laying occurs about a week after the adults emerge. The adult females generally do not travel any great distance to oviposit, providing suitable host plants are in the immediate locality. Thus we can account for marked local infestations.

The eggs are usually laid during the day, near the bases of the host trees. The female first makes a hole in the bark with her mouth-parts, and then turning around the ovipositor is inserted in the injury and an egg is placed beneath the bark. In all, about 22 eggs are laid by a single female, this number varying, however, with the individual.

The eggs are about one-eighth inch long and one-fourth as wide, and rounded at each end, and yellowish in color. They hatch in about sixteen days.

The young larvae, which are cream-colored, footless worms, with dark brown heads, first feed on the inner bark, throwing out the castings through the egg scars. The first summer is spent in the sapwood or bark, the larvae entering the heartwood the second season. The second summer, the larvae mine the heartwood of the infested trees, and after becoming fully mature in the fall, form pupal cells at the ends of the burrows. These cells are plugged tight with frass, and the larvae after passing the winter therein, transform to yellowish pupae the following spring. Later the pupae darken, and in about twenty days from the time the pupae were formed, the adults mature. The adults liberate themselves by gnawing through the wood with their strong mandibles. It, therefore, requires at least two years for a complete life cycle of the borer, although in some cases a longer time is required.

CONTROL MEASURES

Natural Control

The round-headed apple tree borer has but few natural enemies. Woodpeckers are of most consequence in control. These birds extract the larvae from infested trees by the use of their sharp beaks, from the time the first eggs hatch, until the adult beetles emerge. It has been estimated by the authors and other workers that from 50 to 75 per cent of the borers are destroyed in this way.

Removal of Wild Host Plants

Where heavily infested orchards are located near woodland, it will often be found advisable to cut down all *Crataegus*, service berry *(Amelanchier canadensis)*, wild crab *(pyrus* spp.*)* and chokeberry *(Araria* spp.*)*, which are the native food plants and act as breeding places.

Worming

No better means of control is known, than that of worming by hand. This should be done twice a year, preferably about blossoming time, and again in September. As previously stated, the presence of the borer may be determined by the sawdust-like material thrown out from the tree by the larva.

Three tools are needed for the worming operation: Something such as a small hoe, or trowel, to scrape the earth away from the base of the infested tree, a good stout knife, with a sharp point, and a slender wire.

Remove the earth from around the base of the infested tree to the depth of about an inch, and carefully mark with the knife any points on the tree where the sawdust has been thrown out. At these points, cut through the bark until the burrow is reached. If the larva is not in sight try inserting the wire in the gallery with the object of puncturing the larva. The end of the wire when withdrawn will often indicate if the borer has been reached and destroyed. The use of a small chisel is helpful in reaching the deeper burrows. In cutting, remove as little of the bark as possible, and wherever convenient make the cut parallel with the grain.

Use of Carbon Bisulfide

In small plantings the apple tree borer may be successfully controlled by placing a few drops of carbon bisulfide within the gallery entrance where sawdust material is thrown out, and closing the opening with soap, putty or clay.

There are two successful ways of getting the charge of carbon bisulfide into the gallery. The material may be placed in a spring bottom oil can and injected by placing the tip of the spout within the gallery, or small wads of absorbent cotton may be saturated with carbon bisulfide and at once thrust within the gallery, and the opening closed. Carbon bisulfide should be used only when the temperature is above sixty degrees.

Repellents

A certain degree of protection may be had by the use of repellent washes on the trunks of the trees. Many washes have been tried, but probably the safest and cheapest is a wash made from lime sulphur sludge, or lime sulphur diluted at the rate of one to seven, and made into a heavy wash by the addition of lime. This wash should be applied the middle of May, and again about the middle of June. This wash acts as a repellent, preventing the female from laying eggs. The effectiveness depends upon the thoroughness of application.

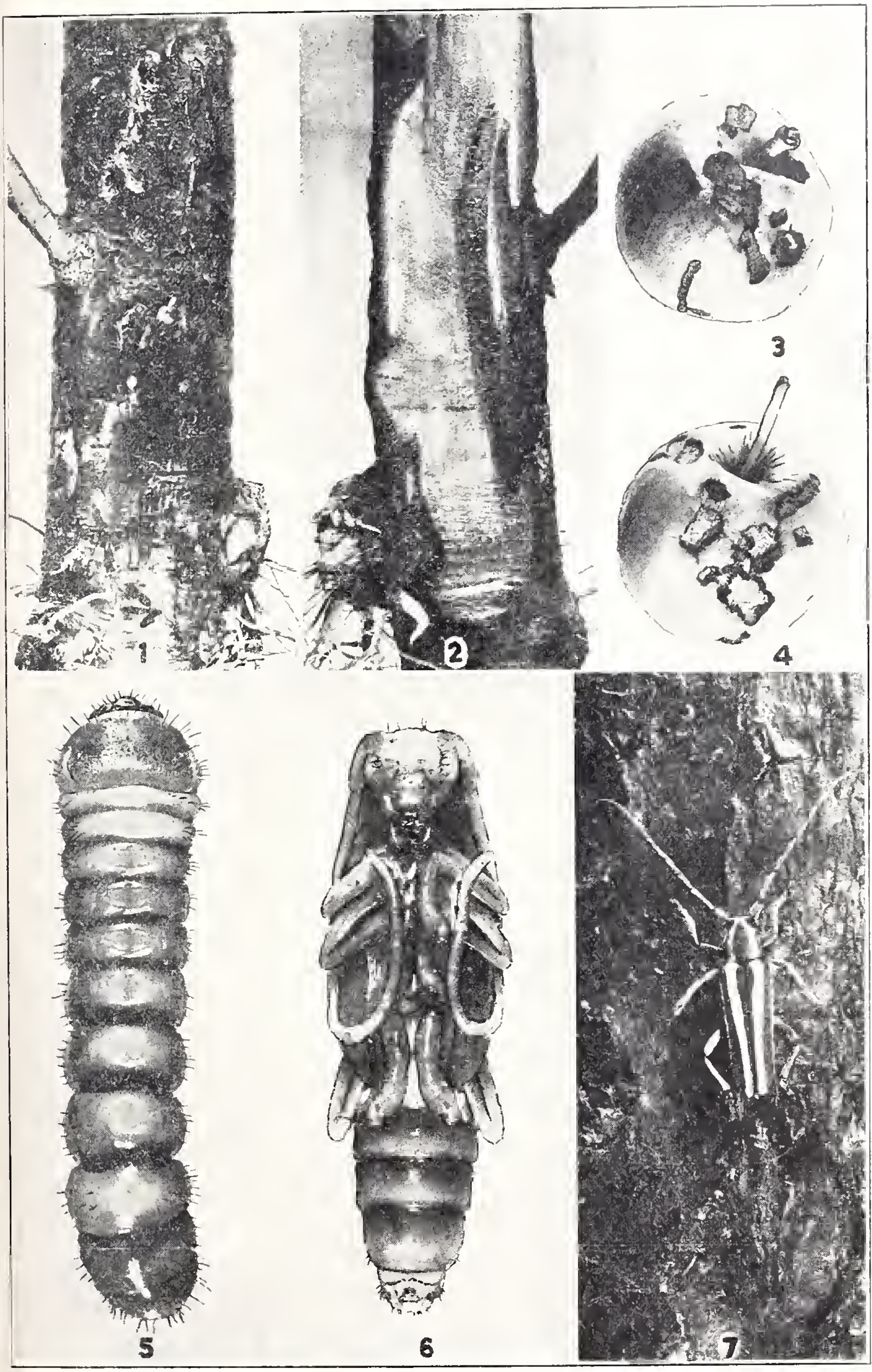

Plate I

1. Young apple tree infested with round headed apple tree borer.
2. Section of the same tree showing borer galleries.
3 & 4. Adult beetle feeding injury on apples.
5. The larva of the round headed apple tree borer.
6. Pupa of round headed apple tree borer.
7. The adult beetle.

Photographs by H. B. Kirk.